

Applicants: GÖPPERICH, Achim et al.
Serial No: 10/019,797
U.S. National Phase of PCT/EP 00/06313

In the Claims:

Please amend the claims as follows:

1. (Amended Once) A block copolymer comprising:
a hydrophobic biodegradable polymer a),
a hydrophilic polymer b),
at least one reactive group c) for covalent binding of a surface-modifying substance d) to the hydrophilic polymer b),
wherein the at least one reactive group c) is an at least bifunctional molecule with at least one free functional group.
2. (Amended Once) The block copolymer of Claim 1, wherein the hydrophobic polymer a) and/or hydrophilic polymer b) are selected from the group consisting of a linear polymer, a branched polymer, and combinations thereof.
3. (Amended Once) The block copolymer of claim1, wherein the hydrophobic polymer a) is at least one polymer selected from the group consisting of polyester, poly- ϵ -caprolactam, poly- α -hydroxyester, poly- β -hydroxyester, polyamide, polyphosphazene, polyanhydride, polydioxanon, polymalic acid, polytartaric acid, polyorthoester, polycarbonate, peptide, polysaccharide and protein.
4. (Amended Once) The block copolymer of Claim 3, wherein the hydrophobic polymer a) is at least one polymer selected from polylactide, polyglycolide, poly(lactide-co-glycolide), poly- β -hydroxybutyrate and poly- β -hydroxyvalerate.

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5. (Amended Once) The block copolymer of claim 1, wherein the hydrophilic polymer b) is at least one polymer selected from the group consisting of polyethylene glycol, polypropylene glycol, polyethylene glycol/polypropylene glycol copolymer, polyethylene glycol/polypropylene glycol/polyethylene glycol copolymer, polybutylene glycol, polyacrylamide, polyvinyl alcohol, polysaccharide, peptide and protein.

6. (Amended Once) The block copolymer of claim 1, wherein the reactive group c) is at least one selected from a dicarboxylic acid amide, 3-maleic imidopropionic acid-N-succinimidyl ester and succinimidyl ester.

7. (Amended Once) The block copolymer of claim 1, wherein the hydrophobic polymer a) is at least one selected from polylactide, polyglycolide and poly(lactide-co-glycolide).

8. (Amended Once) The block copolymer of Claim 7, wherein the hydrophilic polymer b) is polyethylene glycol.

9. (Amended Once) The block copolymer of Claim 8, wherein the polyethylene glycol has a molar mass in a range of 200 to 10 000 Da.

10. (Amended Once) The block copolymer of claim 1, wherein the hydrophobic polymer a) is polylactide preferably with a molar mass in a range of 1 000 to 100 000 Da.

11. (Amended Once) The block copolymer of claim 1, wherein the surface of the block copolymer is chemically structured by binding of surface-modifying substances d).

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12. (Amended Once) The block copolymer of Claim 1, wherein the block copolymer additionally contains at least one surface-modifying substance d), wherein substance d) is bonded to the hydrophilic polymer b) by means of the reactive group c).

13. (Amended Once) The block copolymer of Claim 12, wherein the substance d) is at least one substance selected from a carbohydrate, peptide, protein, heteroglycan, proteo-glycan, glycoprotein, amino acid, fat, phospholipid, glycolipid, lipoprotein, medicinal agent, antibody, enzyme, DNA/RNA, a cell, dye and molecular sensor.

14. (Amended Once) A shaped body formed from the block copolymer of Claim 1.

15. (Amended Once) The shaped body of Claim 14, wherein the shaped body is a film, particle, three-dimensional body, porous body or a sponge.

16. (Amended Once) The use of a block copolymer according to Claim 1 for the production of drug-targeting systems, drug-delivery systems, bioreactors, for therapeutic and diagnostic purposes, for tissue engineering and as emulsifier.

17. (Amended Once) The process for the production of a block copolymer of Claim 12, wherein the at least one substance d) is converted with a block copolymer according to Claim 1, wherein the block copolymer is present in solution or in the solid phase.

18. (Amended Once) The process according to Claim 17, wherein for binding the at least one substance d), the block copolymer according to Claim 1 is used in the form of a porous shaped body.

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19. (Amended Once) The process for the production of a block copolymer according to Claim 12, wherein in a first stage, the substance d) is provided with a reactive group c) and in a second stage, the complex composed of substance d) and reactive group c) is bonded by means of the reactive group c) to the hydrophilic polymer b) of a block copolymer composed of a hydrophobic polymer a) and a hydrophilic polymer b).

20. (Amended Once) The process for the production of a block copolymer according to Claim 12, wherein the binding of the at least one substance d) to the surface of the block copolymer is achieved by generating a substrate pattern, and the reactive group c) is selected from 1) an at least bifunctional molecule with at least one free functional group and/or 2) a functional group.

21. (Amended Once) The process according to Claim 20, wherein the substance d) is applied with a locally constant or variable concentration by means of the reactive group c) on the surface of a block copolymer containing a hydrophobic component a) and hydrophilic component b).

22. (Amended Once) The process according to Claim 20, wherein for binding the reactive group c) and/or the substance d) in a substrate pattern, the surface of the block copolymer is structured by a plotter, an ink jet printer, radiation with light, bombardment with particles, stamping or soft lithography.

Please add the following new claims:

--23. (New) The process for the production of a block copolymer according to Claim 13, wherein in a first stage, the substance d) is provided with a reactive group c) and in a second stage, the complex composed of substance d) and reactive group c) is bonded by means of the reactive group c) to the hydrophilic polymer b) of a block copolymer composed of a hydrophobic polymer a) and a hydrophilic polymer b).

24. (New) The process for the production of a block copolymer according to Claim 17, wherein in a first stage, the substance d) is provided with a reactive group c) and in a second stage, the complex composed of substance d) and reactive group c) is bonded by means of the reactive group c) to the hydrophilic polymer b) of a block copolymer composed of a hydrophobic polymer a) and a hydrophilic polymer b).

25. (New) The process for the production of a block copolymer according to Claim 18, wherein in a first stage, the substance d) is provided with a reactive group c) and in a second stage, the complex composed of substance d) and reactive group c) is bonded by means of the reactive group c) to the hydrophilic polymer b) of a block copolymer composed of a hydrophobic polymer a) and a hydrophilic polymer b).

26. (New) The process for the production of a block copolymer according to Claim 13, wherein the binding of the at least one substance d) to the surface of the block co-polymer is achieved by generating a substrate pattern, and the reactive group c) is selected from 1) an at least bifunctional molecule with at least one free functional group and/or 2) a functional group.

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27. (New) The process for the production of a block copolymer according to Claim 17, wherein the binding of the at least one substance d) to the surface of the block co-polymer is achieved by generating a substrate pattern, and the reactive group c) is selected from 1) an at least bifunctional molecule with at least one free functional group and/or 2) a functional group.

28. (New) The process for the production of a block copolymer according to Claim 18, wherein the binding of the at least one substance d) to the surface of the block co-polymer is achieved by generating a substrate pattern, and the reactive group c) is selected from 1) an at least bifunctional molecule with at least one free functional group and/or 2) a functional group.

29. (New) The process according to Claim 26, wherein the substance d) is applied with a locally constant or variable concentration by means of the reactive group c) on the surface of a block copolymer containing a hydrophobic component a) and hydrophilic component b).

30. (New) The process according to Claim 27, wherein the substance d) is applied with a locally constant or variable concentration by means of the reactive group c) on the surface of a block copolymer containing a hydrophobic component a) and hydrophilic component b).

31. (New) The process according to Claim 28, wherein the substance d) is applied with a locally constant or variable concentration by means of the reactive group c) on the surface of a block copolymer containing a hydrophobic component a) and hydrophilic component b).

32. (New) The process according to Claim 21 wherein for binding the reactive group c) and/or the substance d) in a substrate pattern, the surface of the block copolymer is structured